

Endangered Species Act - Section 7 Consultation

**BIOLOGICAL OPINION AND
INCIDENTAL TAKE STATEMENT**

Programs Administered by the Bureau of Indian Affairs and Activities Authorized by
the U.S. Fish and Wildlife Service Supporting Tribal Salmon Fisheries Affecting Listed
Puget Sound Chinook and Hood Canal Summer-run Chum Salmon
Evolutionarily Significant Units

Action Agencies:

Bureau of Indian Affairs
U.S. Fish and Wildlife Service

Consultation Conducted by
National Marine Fisheries Service
Sustainable Fisheries Division

Date Issued: SEP 14 2001

Background, Consultation History, and Affected Evolutionarily Significant Units

This document constitutes the National Marine Fisheries Service (NMFS) biological opinion for proposed actions by the Bureau of Indian Affairs (BIA) and the U.S. Fish and Wildlife Service (USFWS) described below. This opinion has been prepared in accordance with section 7 of the Endangered Species Act (ESA) of 1973 as amended (16 U.S.C. 1531 et seq). It is based on information provided in the joint Resource Management Plans (RMP) prepared under NMFS ESA section 4(d) rule for threatened salmonids (discussed below), NMFS Evaluation and Determination Memorandums (Appendices A and B) and previous biological opinions on the effects from these actions on Puget Sound chinook and Hood Canal summer-run chum Evolutionarily Significant Units (ESUs) in the action area. These documents comprise the best available scientific information regarding the effects of the proposed actions on these ESUs. A complete administrative record of these consultations is on file with NMFS' Northwest Region Sustainable Fisheries Division office in Seattle, Washington.

NMFS ESA section 4(d) rule for 14 threatened ESUs (50 CFR 223.203) contains a take limit for joint state/tribal resource management plans. The rule provides that the prohibitions of section 9(a)(1) of the ESA (16 U.S.C. 1538) do not apply to resource management plans that meet the requirements of that limit. The Washington Department of Fish and Wildlife (WDFW) and Puget Sound treaty tribes provided two jointly developed resource management plans (RMPs) to NMFS for Pacific Coast ocean and Puget Sound salmon fisheries affecting the Hood Canal summer-run chum and Puget Sound chinook ESUs. In April, 2001, NMFS determined that both RMPs met the requirements of limit 6 under 50 CFR 223.203(b) and that implementation of the RMPs would not appreciably reduce the likelihood of survival and recovery of either affected ESU. NMFS evaluations and determination of these RMPs are described in the attached Appendices.

The BIA provides funding for programs that support the tribal fisheries included in those RMPs. The USFWS is a party to the Hood Canal Salmon Management Plan (HCSMP) which establishes management objectives for salmon originating from Hood Canal such as those described in the Hood Canal summer chum RMP. Therefore, this opinion considers the effects of these federal actions on the Puget Sound chinook and Hood Canal summer-run chum ESU.

NMFS has considered the effects of these and other federal fishery actions on salmon and steelhead species listed under the ESA in several previous biological opinions (Table 1). In its biological opinion on the 2000-2001 cycle fisheries, NMFS combined its consultation on Pacific coast salmon fisheries with those that occurred in Puget Sound because of the interrelated nature of the preseason planning processes, to provide a more inclusive assessment of harvest-related impacts to the listed species, and for reasons of efficiency. The effects of Pacific Coast ocean and Puget Sound fisheries on the Snake River fall chinook, Snake River spring/summer chinook, and Snake River sockeye, Sacramento River winter chinook, Southern Oregon/Northern California Coastal coho, Central California Coastal coho, Oregon Coastal Natural coho, Central Valley Spring-Run chinook, California Coastal chinook, Lower Columbia River chinook, Upper Willamette River chinook, Upper Columbia River spring chinook, Columbia River chum, Ozette Lake sockeye and ten steelhead ESUs are covered by long-term biological opinions (see Table 1).

These ESUs will not be discussed further in this opinion.

Description of the Proposed Action

The WDFW and the Puget Sound treaty tribes (Co-managers) manage Puget Sound fisheries pursuant to the Puget Sound Salmon Management Plan (PSSMP) which was adopted by court order as a sub-proceeding related to U.S. v. Washington. The purpose of the PSSMP is to establish guidelines for management of salmon and steelhead resources originating in Puget Sound. The PSSMP applies to all marine and freshwater fisheries in Puget Sound from the Strait of Juan de Fuca eastward. Fisheries within Puget Sound occur at different times throughout the year depending on the location and the target species. The gear used varies by fishery but includes troll, hook and line, gill net, beach seine and purse seine. Puget Sound fisheries occur on all five salmon species but the harvest of any particular species varies by location.

The BIA provides funding to the Puget Sound tribes that supports their fisheries management programs conducted under the PSSMP. The USFWS is party to the HCSMP which is a regional plan and stipulated order related to the PSSMP. The state, tribal, and federal parties to the HCSMP establish management objectives for stocks originating in Hood Canal including listed chinook and summer-run chum stocks. Management under the HCSMP affects those fisheries where Hood Canal salmon stocks are caught. BIA funding of tribal fisheries programs and, as a party to the HCSMP, USFWS' participation in the establishment of management objectives affecting listed species comprise the two federal actions considered in this opinion.

The RMPs provide management objectives and reporting procedures consistent with sections 3, 9 and 13 of the PSSMP and by reference in section 9 of the HCSMP. The Co-managers will manage all Puget Sound and Pacific coast ocean fisheries such that they are consistent with the management objectives described in the RMPs. In addition to exploitation rates and abundance thresholds, the Hood Canal summer chum RMP also includes a specific harvest regime, i.e., fishing periods and non-retention requirements by area and gear type. The RMPs also include provisions for inseason monitoring, and annual postseason fisheries assessments and reporting. Periodically, the RMPs will undergo comprehensive reviews to evaluate their effectiveness, assumptions, and regulatory compliance. The RMPs will be revised as necessary to incorporate new information. The Puget Sound chinook RMP is in effect through April, 2003 at which time NMFS will consider extending the application of the take limit. The Hood Canal and Strait of Juan de Fuca summer chum RMP remains in effect until such time as NMFS determines the take limit should be withdrawn.

These two actions, affecting the same ESUs, have been grouped into this single biological opinion for efficiency, consistent with 50 CFR 402.14(b), which allows NMFS to group a number of similar, individual actions within a given geographic area or segment of a comprehensive plan. The duration of the action is indefinite until such time circumstances may require re-initiation (see discussion of Re-initiation of Consultation, below).

Description of the Action Area

The action area for this opinion is the area defined by the Puget Sound and Hood Canal summer-run chum ESUs (Johnson *et al.* 1997, Myers *et al.* 1998) and the western Strait of Juan de Fuca ((4(i) of Attachment 1 in Appendices A and B), and Washington coastal ocean fisheries under the jurisdiction of the Pacific Fisheries Management Council within the Exclusive Economic Zone (3-200 miles off shore). The RMPs encompass Pacific Coast ocean and Puget Sound fisheries affecting the Puget Sound chinook and Hood Canal summer-run chum salmon ESUs, although harvest objectives specified in the RMP account for fisheries-related mortality throughout the migratory range of Puget Sound chinook, and Hood Canal and Strait of Juan de Fuca summer chum – from the southern Oregon coast to Southeast Alaska, including Canada.

Table 1. NMFS ESA action on ESUs affected by Pacific Coast ocean fisheries under the jurisdiction of the PFMC and/or Puget Sound fisheries and duration of the ESA action.

Date (Type of Action)	Duration	ESU(s) considered
March 1, 1991 (BO)	superseded	Sacramento River winter chinook
March 8, 1996 (BO)	until reinitiated 5 years	Snake River chinook and sockeye Sacramento River winter chinook
February 18, 1997 (BO)	4 years	Sacramento River winter chinook
April 30, 1997 (BO)	1 year	S. Oregon/Northern California Coastal coho, Central California Coastal coho, Umpqua River cutthroat trout all steelhead ESUs proposed for listing
April 29, 1998 (BO)	1 year	S. Oregon/Northern California Coastal coho Central California Coastal coho Umpqua River cutthroat trout eight listed steelhead ESUs
April 28, 1999 (BO)	until reinitiated	S. Oregon/Northern California Coastal coho Central California Coastal coho Oregon Coastal Natural coho
April 30, 1999 (BO)	1 year	Puget Sound chinook Lower Columbia River chinook Upper Willamette River chinook Upper Columbia River spring chinook ten steelhead ESUs Ozette Lake sockeye Hood Canal summer-run chum Columbia River chum Umpqua River cutthroat trout (under USFWS)
April, 2000 (BO)	until reinitiated	Central Valley Spring-Run chinook California Coastal chinook
April, 2000 (BO)	1 year	Puget Sound chinook Lower Columbia River chinook Upper Willamette River chinook Upper Columbia River spring chinook ten steelhead ESUs Ozette Lake sockeye Hood Canal summer-run chum Columbia River chum Umpqua River cutthroat trout (under USFWS)
April, 2001 (4(d) Limit)	2 years until withdrawn	Puget Sound chinook Hood Canal summer-run chum
April, 2001 (BO)	until withdrawn	Lower Columbia River chinook Upper Willamette River chinook Upper Columbia River spring chinook Ozette Lake sockeye ten steelhead ESUs Columbia River chum

Status of the Species and Critical Habitat

Section 4(i)(A) and (B) of the E&D documents (see Attachment 1 in Appendices A and B) contain currently available information about the structure and status of populations within the Puget Sound chinook and Hood Canal summer-run chum ESUs. More detailed information on each population can be found in the RMPs themselves (PNPTT/WDFW 2000, PSTT/WDFW 2001), and NMFS' 2000 opinion on the Puget Sound and Pacific Coast ocean fisheries (NMFS 2000). The following paragraphs provide a summary of their status.

Hood Canal summer-run chum

The Hood Canal summer-run chum ESU was listed as threatened in March, 1999 (64 FR 14508). The ESU has two geographically distinct regions: the Strait of Juan de Fuca and Hood Canal. Although the populations all share similar life history traits, the summer chum populations in the two regions are affected by different environmental and harvest impacts and display varying survival patterns and stock status trends. Of the sixteen populations of summer chum identified in this ESU, seven are considered to be "functionally extinct" (Skokomish, Finch Cr., Anderson Cr., Dewatto, Tahuya, Big Beef Cr., and Chimum). The remaining nine populations are well distributed throughout the ESU except for the eastern side of Hood Canal; however, those populations were among the least productive in the ESU (PNPT/WDFW 2000). Five hatchery populations are considered part of the ESU although none of the hatchery populations were listed.

Although abundance was high in the late 1970's, abundance for most summer chum populations in Hood Canal declined rapidly beginning in 1979, and has remained at depressed levels. The terminal abundance of summer chum in the Strait of Juan de Fuca region began to decline in 1989, a decade after the decline observed for summer chum in Hood Canal. Although severely depressed in the early 1990s, terminal abundance has increased since that time. Supplementation programs were instituted in 1992 for several stocks in Hood Canal and the Strait of Juan de Fuca due to the assessment of high risk of extinction for these stocks, and increases in escapements observed in recent years may be due in large part to the success of these programs.

The causes of decline for the Hood Canal summer-run chum ESU have been attributed to a combination of high fishery exploitation rates, shifts in climatic conditions that have changed patterns and intensity of precipitation, and the cumulative effects of habitat degradation (PNPTC/WDFW 2000, Johnson *et al.* 1997).

Puget Sound chinook

The Puget Sound chinook ESU was listed as threatened in March, 1999 (64 FR 14308). It includes all runs of chinook salmon in the Puget Sound region from the North Fork Nooksack River to the Elwha River on the Olympic Peninsula. Spring-run chinook hatchery populations from Kendall Creek, the North Fork Stillaguamish River, White River, and Dungeness River, and fall run fish from the Elwha River are listed. The long- and short-term escapement trends for natural chinook salmon runs in North Puget Sound have been predominately negative, although the North Fork Nooksack, Stillaguamish and Snohomish systems have shown improvements in escapements since 1996. In South Puget Sound and Hood Canal, both long- and short-term

trends in escapements are predominantly positive. However, the contribution of hatchery fish to natural escapements in these region may be substantial, masking the trends in natural production.

Critical habitat for the Puget Sound chinook and Hood Canal summer-run chum salmon were designated on February 16, 2000 (65 FR 7764). Designated critical habitat for the Hood Canal summer-run chum ESU includes all freshwater areas below designated dams or impassable natural barriers that are accessible to listed summer chum in Hood Canal and the Olympic Peninsula, as well as the estuarine and marine areas of Hood Canal, Admiralty Inlet, and the Strait of Juan de Fuca to the international boundary and as far west as a straight line extending north from Dungeness Bay. For the Puget Sound chinook ESU, critical habitat includes the estuarine, marine and freshwater areas in Puget Sound below designated dams or impassable natural barriers, to the international boundary with Canada at the outer extent of the Strait of Georgia, Haro Strait, and the Strait of Juan de Fuca to a straight line extending north from the west end of Freshwater Bay. The offshore marine areas, including those under the jurisdiction of the PFM, are not included in either critical habitat designation.

Environmental Baseline

The environmental baseline for this biological opinion is the culmination of the effects of past and present state, Federal, tribal, local and private actions in the action area as well as the expected impacts of proposed Federal actions that have undergone ESA section 7 consultations. A multitude of actions, as well as natural conditions have contributed to the decline of these ESUs and the environmental baseline does not currently meet the biological requirements of these species. In addition to the impact of harvest that is the focus of this opinion, the species of concern are affected by impacts related to habitat degradation, hatchery programs, and hydro-development. The relative effect of each “H” to each ESU, and to each stock within an ESU, differs. Chinook and chum are also prey for pelagic fishes, birds, and marine mammals, including harbor seals, sea lions, and killer whales. The harvest standards in the RMPs and discussed in this opinion were developed under assumptions of current habitat productivity and capacity.

The Puget Sound Salmon Stock Review Group (PSSSRG), a subcommittee of the PFM, assessed the habitat condition as part of a larger review of several Puget Sound chinook and coho stocks that met the criteria of overfished stocks under the PFM salmon FMP. While this review only included a subset of Puget Sound chinook stocks, similar habitat impacts are found in most watersheds within the Puget Sound chinook ESU. It reported that reductions in the habitat capacity and habitat quality of the Skagit, Stillaguamish, Snohomish and Strait of Juan de Fuca watersheds have contributed to shortfalls in escapements (PSSSRG 1997). The loss of large woody debris (LWD), critical for creating and maintaining chinook habitat, has exacerbated low flow conditions, resulting in increased sediment load and higher water temperatures. Removal of LWD from Strait of Juan de Fuca streams such as the Pysht (historic volume of LWD reduced by 80%) and Dungeness has significantly reduced summer and winter rearing habitat in these systems. It has been suggested that increased sediment load resulting from a variety of land use practices has contributed to the loss of spawning, early incubation and winter rearing habitat in

the Stillaguamish and Strait of Juan de Fuca systems (PSSSRG 1997).

A habitat assessment conducted by the Point No Point Treaty Tribes and Washington Department of Fish and Wildlife (2000) concluded that channel, riparian forest and sub-estuarine conditions were moderately to severely degraded in all the watersheds in the HCS chum ESU due to a history of logging, road building, rural development, agriculture, water withdrawal, and channel manipulations throughout the ESU. The Tahuya and Dewatto watersheds are considered to be recovering and in good condition which should increase the chances of success for recovery efforts. The other systems in the region are moderately degraded, with areas of good habitat. Nearshore marine habitat throughout the ESU has also been severely degraded. Chinook salmon are also exposed to high rates of natural predation, particularly during freshwater rearing and migration stages.

Hydro development is less a factor in Puget Sound than in other regions, but it also has substantially affected or eliminated some populations. In some cases, the effects are direct as the dams block access to spawning and rearing habitat. In other cases, the effects are less direct, but nonetheless significant as they increase downstream and upstream passage mortality, change natural flow regimes, de-water or reduce flow to downstream areas, block the recruitment of spawning gravel, or result in elevated temperatures. For example, hydromodification in the Skagit system has resulted in a loss of 64% of its distributary sloughs and 45% of side channel sloughs.

The variation in ocean conditions and general pattern of long-term decline in ocean productivity has been an important contributor to the decline of many stocks. For example, the smolt-to-adult survival rates for Puget Sound chinook stocks dropped sharply beginning with the 1979 broods to less than half of what they were during the 1974-1977 brood years (Cramer 1999). Climatic regime shifts have been suggested as a primary cause of the significant declines in Hood Canal summer chum populations beginning in the late 1970's, and the Strait of Juan de Fuca summer chum populations in the late 1980s (PNPTT/WDFW 2000). The pattern of response to these changing ocean conditions has differed between stocks, presumably due to differences in their timing and distribution. However, the survival and recovery of the affected ESUs depends on their ability to persist through periods of low ocean survival when stocks may depend on better quality freshwater habitat and lower relative harvest rates.

Hatcheries have both positive and negative effects. Hatcheries are increasingly important in conserving natural populations in areas where the habitat can no longer support natural production or where the numbers of returning adults are so low that intervention is required to reduce the immediate risk of extinction. Supplementation programs in Hood Canal and the Strait of Juan de Fuca have been successful in rebuilding abundance in several areas. However, there are also negative consequences associated with hatchery programs, particularly as they were developed and managed in the past. Significant contributions of hatchery reared chinook to some systems in South Puget Sound may be masking trends in natural production from these systems. Domestication effects are concerns for hatchery programs in other areas. Hatchery activities in Puget Sound and the Columbia Basin are currently the subject of ongoing ESA section 7

consultation and 4(d) evaluation will address the adverse effects of ongoing hatchery programs.

Listed Puget Sound chinook and Hood Canal summer-run chum are primarily taken in salmon fisheries off the British Columbia coast, and in Puget Sound. They are encountered less often in Southern U.S. (SUS) ocean salmon fisheries (Oregon, Washington and California) and only rarely in groundfish fisheries in the U.S. and British Columbia. Until recently, exploitation rates on the Puget Sound chinook and Hood Canal summer-run chum ESUs have been too high for many of the component stocks and have contributed to their decline, particularly because of what we now know about the long-term decline in ocean productivity. Total fishery exploitation rates on the Hood Canal summer-run chum ESU averaged 44.5% from 1974-1994 (range = 12.2%-81.2%). Total exploitation rates dropped dramatically in 1995, averaging 3.8% (range = 2.7-5.1%) since that time, as a result of fishery actions taken to protect summer chum and other salmonid species (PNPTC/WDFW 2000). Brood year exploitation rates for Puget Sound chinook populations which averaged 61%-87% historically have declined for the most recent broods (1991-1994), averaging 42%-70% depending on the population. The harvest management objectives in the RMPs represent reductions of 50-90% from historic levels based on current estimates of habitat productivity and capacity, conservative estimates of survival and incorporating uncertainty in these parameters.

Effects of the Proposed Action

In its biological opinions NMFS considers 1) the effects of the action on affected listed species within the context of the current status of the species and their environmental baseline, and; 2) whether the action is likely to destroy or adversely modify critical habitat. Tables 2-4 summarize exploitation rate ceilings and low or critical abundance thresholds for management units within the Puget Sound chinook and Hood Canal summer-run chum ESUs, as defined in the RMPs. The RMPs and sections 4(i)(B) and (C) of the E&D documents (see Attachment 1 in Appendices A and B) contain descriptions of the harvest objectives for management units within the Puget Sound chinook and Hood Canal summer-run chum ESUs and analyze in more detail the effects of each. The following discussion is a summary of that information. Although fisheries may be managed for exploitation rates lower than the ceilings in any one year, the rates may not be exceeded. Some management units are managed to achieve an escapement goal in the terminal areas. The abundance thresholds against which the exploitation rates are derived incorporate the concepts and guidance for viable salmonid populations found in the NMFS document, "Viable Salmonid Populations" (McElhaney et al. 2000). PFMC and Puget Sound fisheries will be managed to meet these management objectives, taking into account fisheries-related mortality throughout the migratory range of Puget Sound chinook and Hood Canal summer-run chum from Oregon to Southeast Alaska.

Table 2. Natural Chinook Management units and Associated Objectives (PSTT/WDFW 2001)

Natural Chinook Management Units	Recovery Exploitation Rate Ceiling¹	Appendix C Expected Exploitation Rate	Low Abundance Threshold²
Western Strait Hoko	10% SUS ER ³	8-10% SUS ER	500 spawners (c)
Elwha River	10% SUS ER ³	8-10% SUS ER	1,000 spawners (c)
Dungeness	10% SUS ER ³	8-10% SUS ER	500 spawners (c)
Mid-Hood Canal	15% pre-terminal SUS ER ³ Terminal – 750 spawners (≤15% SUS)	13-15% pre-terminal SUS ER+terminal (≤ 15% SUS)	400 spawners (n)
Skokomish	15% pre-terminal SUS ER Terminal – 3,150 spawners	12-15% pre-terminal SUS ER+terminal	1,300 spawners/ 800 natural spawners (c)
Nooksack Early North Fork South Fork	The Co-managers and NMFS are developing a RER assessment for this stock ⁴	5-7 % SUS	1,000 spawners (n) 1,000 spawners (n)
Skagit Spring	42% Total ER	15-17% SUS or 21-23% Total ER	576 spawners (n)
Skagit Summer/Fall	52% Total ER	12-17% SUS or 29-33% Total ER	4,800 spawners (n)
Stillaguamish Summer/Fall	25% Total ER	9-10% SUS or 15-16% Total ER	500 spawners (n)
Snohomish Summer/Fall	32% Total ER	19-20% SUS or 24-26% Total ER	2,000 spawners (n)
Lake Washington Cedar River Index	15% pre-terminal SUS ER Terminal – 1,200 spawners	11-15% pre-terminal SUS ER+terminal	200 spawners (n)
Green River	15% pre-terminal SUS ER Terminal – 5,800 spawners	10-15% pre-terminal SUS ER+terminal	1,800 spawners (c)
White River Spring	17% Total ER	12% SUS or 13% Total ER	200 spawners (c)
Puyallup River	50% Total ER	26% SUS or 36% Total ER	500 spawners (c)
Nisqually River Chinook	1,100 spawners	Terminal actions taken to achieve 1,100	500 spawners (c)

(n) – low abundance measures as natural origin recruits

(c) - low abundance measures as composite of natural and hatchery returns

1) Interim management ceiling during recovery phase expressed in FRAM values.

2) Level of forecasted spawning abundance that triggers additional management action

3) FRAM exploitation rate measured as total exploitation rate in southern U.S. fisheries.

4) In the interim, management guidance will be derived from Appendix C application.

Table 3. Hood Canal and Strait of Juan de Fuca summer chum management units, populations and Critical Thresholds (PNPTT/WDFW 2000)

Management Unit	Washington Commercial Catch Area	Populations	Critical Thresholds	
			Abundance	Escapement
Sequim Bay	6B	Jimmycometely	<220	<200
Discovery Bay	6B	Snow Creek/Salmon Creek	<790	<720
Dungeness Bay	6D	Dungeness River	Undetermined	
Port Townsend	9	Chimacum Creek	Reintroduction	
Mainstem Hood Canal (Hood Canal Bridge to Ayres Point)	12/12B/12C	Lilliwaup Creek Hamma Hamma R. Duckabush River Dosewallips River	<2,980	<2,660
		Big Beef Creek	Reintroduction	
		Anderson Creek Dewatto Creek Skokomish River Finch Creek	Extinct	
Quilcene/Dabob Bays	12A	Big Quilcene/Little Quilcene	<1,260	<1,110
SE Hood Canal	12D	Union River	<340	<300
		Tahuya River	Extinct	
Total ESU			<5,400	<4,750

Table 4. Expected Base Conservation Regime incidental exploitation rates and ranges by fishery

Fishery	Lower Guideline	Expected Average Exploitation Rate	Upper Guideline
Canadian	2.3%	6.3%	8.3%
U.S. pre-terminal	0.5%	2.5%	3.5%
Hood C. terminal	0.5%	2.1%	3.5%
Hood Canal Total ¹	3.3%	10.9%	15.3%
SJF Total ²	2.8%	8.8%	11.8%
¹ Total of Canadian, U.S. pre-terminal, and Hood Canal terminal exploitation rates. ² Total of Canadian and U.S. pre-terminal exploitation rates. There is no terminal area harvest of Strait of Juan de Fuca (SJF) populations.			

Puget Sound Chinook

For Puget Sound chinook, the co-managers approach to setting exploitation rate ceilings described in the RMP is risk averse in that it is designed to provide high probabilities of survival and recovery. Harvest at the targeted exploitation rate:

- “will not increase the probability of the management unit falling below the critical abundance threshold, in 25 years, by more than 5 percentage points than if the exploitation rate were modeled as zero;
- assures an 80% probability of the management unit exceeding the recovery [viable] escapement level¹ in 25 years.”

For those chinook salmon management units where adequate data were not available to assess recent productivity, or analysis has not yet been completed, the Co-managers adopted a recent year (1998-2000) or an average of recent years' exploitation rates as the objective (Nooksack early, Puyallup and White River management units). The Co-managers manage those management units whose harvest now occurs predominantly outside of Washington waters for SUS exploitation rate objectives (Western Strait of Juan de Fuca, Elwha, Dungeness, Mid-Hood Canal). For the Lake Washington, Green River, Nisqually River and Skokomish River² management units, pre-terminal rates will be fixed and terminal fisheries will be managed to achieve the natural spawner escapement goal based on inseason updates. In any year, should management units or associated populations fall below or be projected to fall below their low abundance thresholds, the Co-managers will reduce SUS exploitation rates until they are consistent with those in Appendix C of the RMP. The Co-managers may also take further actions as necessary (see Attachment 1, section H of Appendices A and B for examples of the types of actions).

Hood Canal summer-run chum

The Hood Canal summer chum RMP defines area specific fishery management actions designed to produce exploitation rates on the average of 10.9%, with a range of 3.3 to 15.3%, on summer chum salmon bound for the Hood Canal and 8.8% total, with a range of 2.8 to 11.8%, on Strait of Juan de Fuca populations. Although in any one year, fisheries may be managed for exploitation rates lower than this range, the upper end of the exploitation rate ranges may not be exceeded. Exploitation rates are defined for each of three fishery aggregates (Table 4). Because of the lack of population specific harvest information in individual fisheries, these exploitation rates are applied to all management units.

¹ For Skagit, the recovery escapement level is the escapement above which there is < 1% probability that the unit will go extinct in 100 years, under existing conditions. The “recovery escapement level” should not be confused with the “recovery goal” which will take into account desired habitat condition.

² Inseason update under development. Terminal fisheries will be managed for preseason expectations of escapement until update is finalized.

In a previous biological opinion, NMFS used a simulation model to compare escapements under the RMP exploitation rates with those under historical exploitation rates and with no fishing (NMFS 2000). The results of the simulations show that 1) harvest would not have been a factor of decline under baseline abundance levels if it had been consistent with RMP rates; and, 2) trends for summer chum populations in both Hood Canal and the Strait of Juan de Fuca under the RMP rates are not substantially different than if there had been no fishing. Section 4(i)(D) of Attachment 1 in Appendix B describes the effect of the management objectives in more detail.

Critical Habitat

Harvest-related activities described in this opinion occur from boats or along river banks. An assessment of the adverse effects of fishing on Pacific salmon Essential Fish Habitat (PFMC 1999) identified general categories of effects from gear and vessel operation. However, the report found that there was no direct evidence that the primary gear types (hook-and-line, purse seines and gill nets) and vessel size used in the RMP fisheries substantively affected the habitat. The report noted the possibility of impacts to eggs and juveniles from redd trampling during recreational fishing. However, the RMPs include area closures and time restrictions to limit or preclude fishing in spawning areas. In its 2000 biological opinion (April 28, 2000), NMFS concluded that, based on the best available scientific and commercial data, the fisheries were not likely to adversely affect critical habitat for Puget Sound chinook or Hood Canal summer chum. NMFS expects that the fishing activities in the Puget Sound and Hood Canal summer chum RMPs will be conducted in a similar or more constrained manner than those in the 2000 opinion. Therefore, there is no new information that would change NMFS' earlier conclusion that these fisheries are not likely to adversely affect critical habitat.

In summary, the analyses on the effects of the Pacific coast ocean and Puget Sound fisheries indicate that the management objectives in the RMPs on which the federal actions are based will not appreciably reduce population abundance of the listed ESUs from what they would have been without fishing, or result in the destruction or adverse modification of critical habitat.

Cumulative Effects

Cumulative effects are the effects of future state, tribal, local, or private activities, not including federal activities, which are reasonably certain to occur within the action area of the federal action subject to consultation. For the purposes of this analysis, the action area is the ocean fishing areas off the coast of Washington and marine and freshwater areas within Puget Sound. Future Federal actions, including other fisheries, hatcheries, and land management activities will be reviewed through separate section 7 consultation processes. Non-Federal actions that require authorization under section 10 of the ESA, and that are not included within the scope of this consultation, will be evaluated in separate section 7 consultations.

Future tribal, state and local government actions will likely to be in the form of legislation, administrative rules, policy initiatives, or land use and other types of permits. Government and private actions may include changes in land and water uses, including ownership and intensity, any of which could impact listed species or their habitat. The impacts associated with these

economic and population demands will probably affect habitat features such as water quality and quantity, which are important to the survival and recovery of the listed species.

Washington's Salmon Recovery Planning Act, the Watershed Planning Act, Forest and Fish Plan, Growth Management Act, court-ordered TMDL management plans, and programs like them are designed to address impacts associated with economic and population growth. Local governments are considering ordinances to address effects on aquatic and fish habitat from different land uses and may also participate in regional watershed health programs, although political will and funding will determine participation and, therefore, the effect of such actions on listed species. Tribal governments are expected to continue to participate in cooperative efforts involving watershed and basin planning designed to improve fish habitat. Private landowners may convert current use of their lands, or they may intensify or diminish current uses, voluntarily initiate actions to improve environmental conditions, or abandon or resist any improvement efforts. Although these plans and initiatives are meant to benefit listed fish, they must be applied and sustained in a comprehensive way before NMFS can consider them "reasonably foreseeable" in its analysis of cumulative effects.

The production of salmon and steelhead in Washington and Oregon hatchery programs will likely continue at some level and has the potential to add cumulative impacts to listed populations in these areas, through competition and predation. Hatchery salmon production also provides targeted harvest opportunity through increasing salmon abundance above that which would occur naturally. All harvest mortality associated with these fisheries is specifically considered in this opinion. At this time, the extent of cumulative impacts from hatchery salmon production is unknown. However, the impacts of hatchery production from Puget Sound and Columbia River hatchery facilities is currently under review through separate consultations.

Conclusion

Sections 4(i)(D) in Attachment 1 of Appendices A and B describe the basis for the conclusion that the proposed harvest management strategies in the RMPs will not appreciably reduce the likelihood of survival and recovery of ESA listed species.

Chinook

The implementation of the proposed fisheries preserves the existing diversity and spatial structure of natural populations within Puget Sound. Management objectives based on natural production or natural spawning have been established for all management units with natural production and their associated populations, and captures the full range of genetic diversity and life history traits exhibited by the natural chinook populations within Puget Sound. Maintenance of management units as aggregates of healthy, self-sustaining populations will ensure the diversity necessary for continuing the long-term productivity of Puget Sound chinook salmon, thereby, conserving the evolutionary legacy of the Puget Sound ESU for chinook salmon as a species. The subset of Puget Sound chinook with completed management unit-specific productivity analysis (Skagit spring, Skagit summer/fall, Snohomish summer/fall, Stillaguamish summer/fall) and those routinely achieving their long-term spawning escapement goals represent

a cross section of these life history traits and 75% of the natural production within Puget Sound (1992- 1996).

This management approach further enhances the probability of survival and recovery of Puget Sound chinook by being responsive to low population status. Minimum spawning escapement levels have been established for each management unit and its associated populations. These low abundance thresholds are established to safeguard against declines to the point of population instability. They significantly exceed the VSP guidelines for many of the populations. When spawning escapement is projected to fall at or below the low abundance thresholds, additional fisheries management measures are triggered to conserve these management units and associated populations (Table 2). Management units currently near or below their low abundance are already being managed at these levels. Reductions to these levels appear to have contributed to stabilization of escapements in recent years for most populations.

The long-term approach used to determine exploitation rates objectives is conservative, provides quantitative measures of survival and recovery, and isolates the effect of harvest. This approach is important in ensuring that harvest actions do not impede recovery regardless of the effects of the other Hs, and as importantly, that the treaty and non-treaty fishermen do not bear the burden of conservation beyond the effects of their actions. These objectives represent exploitation rate ceilings. Actual exploitation rates have been below them in most recent years. However, some caution is warranted since exploitation rates using this approach have yet to be completed for several of the populations in the ESU for which data is available. These should be completed within the next couple of years.

The proposed objectives are generally consistent with NMFS' RER population standards previously used to assess likelihood of survival and recovery of the Puget Sound ESU. These standards included an assessment of the long-term effects of exploitation rates at these levels.

The management of these fisheries represents significant changes in Puget Sound harvest management practices, and is expected to significantly reduce or eliminate harvest as a factor of decline of the Puget Sound chinook ESU. In previous years, significant portions of Puget Sound were managed for hatchery production objectives. The RMP establishes management objectives for all management units with natural production, and associated populations based on natural production or natural spawning objectives. Exploitation rates on Puget Sound chinook populations during 1983-1996 averaged 27-83%³ (8-51% SUS) depending on the management unit. Exploitation rates since the chinook status review was completed, 1997-2000, have averaged 20-68% (6-61% SUS), a reduction of 30-55%. The exploitation rates are at or below those observed in recent years. Declines in exploitation rates have contributed to stabilized or increasing escapements observed for many populations.

The RMP approach to establishing management objectives is risk averse and progressive,

³ As measured by the Fisheries Regulation and Assessment Model (FRAM), the primary model used in assessment of Puget Sound and Washington ocean fisheries.

representing significant improvements from past management practices: (1) Management objectives based on natural production and natural spawning have been established for the majority of populations with natural production for which data is available. These management units represent the entire range of life history types (races) and geographic distribution that comprise the Puget Sound ESU; (2) It derives exploitation rates based on conservative, quantifiable standards directly related to recovery, and incorporates uncertainty; (3) In isolating the effect of harvest on survival and recovery, the approach is valuable in ensuring that harvest actions do not impede recovery, regardless of the contribution of the other Hs. At the same, the approach is linked to the other Hs by taking into account current environmental and habitat conditions. The TRT results are expected to address some of the current uncertainties in management objectives as they relate to population structure. The most depressed populations must be monitored closely to evaluate whether they are improving or continuing to remain stable. If the populations continue to decline, further harvest actions may be considered, but at these low rates, it is uncertain whether additional harvest restrictions would provide significant benefit to the population. The inclusion of new information through monitoring and evaluation provides greater assurance that objectives will be achieved in future seasons. The Co-managers have committed to taking additional actions to ensure that salmon fishing-related mortality is consistent with exploitation rate and escapement objectives.

Hood Canal Summer-run Chum

The fisheries as proposed and implemented under the RMP will preserve the existing diversity and spatial structure of natural populations within Puget Sound. This management approach further enhances the probability of survival and recovery of Hood Canal summer chum by being responsive to low population status. Minimum spawning escapement levels have been established for each management unit and its associated populations. These low abundance thresholds are established to safeguard against declines to the point of population instability.

The RMP represents significant changes in the management approach and reduction in mortality for summer chum in Hood Canal and the Strait of Juan de Fuca. Prior to 1992, fisheries were not managed to achieve management objectives specific to summer chum salmon. The RMP includes fishery-specific exploitation rates and natural escapement objectives for all extant summer chum populations in Hood Canal and the Strait of Juan de Fuca. Fisheries will be managed for these objectives regardless of the abundance of other species. These strategies are expected to result in significant reductions from total exploitation levels estimated for the period from the 1980s to the early 1990s, which were the result of fisheries targeted at other species. The harvest management portion of the RMP, by establishing annual fishing regimes for U.S. and Canadian pre-terminal, and Washington terminal area fisheries, is designed to greatly reduce incidental harvest of summer chum salmon, during fisheries conducted for the harvest of other species. The expected reduction in incidental interceptions, relative to the high rates observed during the 1985 to 1991 period, is approximately 71% for Canadian fisheries, 50% for U.S. pre-terminal, and 93% for Washington terminal area fisheries.

The intent of the Base Conservation Regime (BCR) is to initiate rebuilding by providing incremental increases in escapement over time, while allowing a limited opportunity to harvest

other species. Exploitation rates under the RMP are conservative, passing through to spawning escapement on average, in excess of 91% of the Hood Canal and the Strait of Juan de Fuca summer chum runsize (harvest and escapement) to U.S. waters, and approximately 89% of the total runsize of the run to each management unit. Since 1992, some improvements in escapements have occurred coincident with the implementation of lower exploitation rates. For those populations below their critical escapement thresholds, terminal fisheries have been closed, fisheries on other species have been delayed and chum salmon non-retention has been required in most areas. For example, U.S. harvest on the Strait of Juan de Fuca component of the ESU has been restricted to 0.5 to 3.5%, or less than four fish caught per 100 returning adults. At this very restrictive exploitation rate, harvest should not impede the recovery of the populations.

In a previous biological opinion, NMFS used a simulation model to compare escapements under the RMP exploitation rates with those with no fishing (NMFS 2000b). The simulation used data from 1974 to 1994 which encompassed the observed range of abundances and survival and is prior to the use of supplementation. The results of the simulation show that trends for populations in both regions are not substantially different than if there had been no fishing. The simulation results were also compared with observed baseline abundance when exploitation rates were much higher. Hood Canal escapements, in particular, would have benefitted from the reduced exploitation rates. Populations would have been above critical escapement threshold levels in most years, and dramatically above the observed values. In those years when abundance fell below critical escapement threshold levels, the results show that fishing would not have been a contributing factor, i.e., the escapement would have fallen below the critical threshold even if fishing mortality had been zero.

Results from the simulation for the Strait of Juan de Fuca indicate that in some years populations would have been depressed even absent all harvest, but that reduced harvest would have allowed for population growth over what was observed in years when the inherent productivity of the system permitted. It is apparent from the model results that the summer chum populations in the Strait of Juan de Fuca region have been constrained more by environmental conditions than by historical harvest effects, as opposed to summer chum populations in the Hood Canal region in which reduced fishing might have made a significant difference to annual escapement, and in long-term population growth. Therefore, the RMP should not appreciably decrease the likelihood of survival and recovery, and should provide significant benefits to escapement in most years.

The simulations conducted for the years 1974 to 1994 provide data on what to reasonably expect once the plan is implemented. The average and upper end of the BCR exploitation rate range were modeled for those years. It is noted that exploitation rates since 1994 have fallen within the range of exploitation rates used in the simulation. The RMP also calls for specific and integrated monitoring programs to maintain and improve population assessment methodologies as well as evaluating the effectiveness of harvest management actions and objectives.

The RMP describes specific management actions taken to meet the exploitation rates and escapement objectives of the BCR. These actions include closure of summer chum-directed

fisheries, delayed or truncated fishery openings for other salmonid species, net length and mesh size restrictions, limited soak times for gillnets, non-retention of chum salmon, and time, area or gear restrictions. If in-season conditions deviate significantly from the preseason expectations, the co-managers will meet prior to implementation of additional fisheries to reach agreement on an appropriate management strategy.

The RMP is designed to limit fishing mortality to a rate that permits a high proportion of the summer chum salmon run to return to spawning grounds and thus accommodate the maintenance and rebuilding of self-sustaining populations. These harvest management measures in the RMP are designed to apportion harvest impacts between or within management units based on and responsive to population status and individual population characteristics, and to result in a broad distribution of spawners throughout all populations in the Hood Canal and Strait of Juan de Fuca region. The RMP harvest management actions, when coordinated with habitat protection/restoration and supplementation actions, should lead to the maintenance and restoration of genetic and biological diversity within the Hood Canal and Strait of Juan de Fuca region, and provide for the conservation of the Hood Canal Summer-Run Chum Salmon ESU.

Based on the discussions and analysis in the appendices and in the above sections of this opinion, NMFS concludes that the proposed Federal Actions considered in this opinion are not likely to jeopardize the continued existence of Puget Sound chinook salmon or the Hood Canal summer-run chum salmon ESUs, or result in the destruction or adverse modification of designated critical habitats for these ESUs.

In addition, NMFS' ESA 4(d) rule is designed to encourage activities that will conserve listed species. If the programs are consistent with the Rule's limits, ESA take prohibitions will not apply to those programs. NMFS determined that the Puget Sound chinook and Hood Canal summer chum RMPs provided by the WDFW and Puget Sound treaty tribes were consistent with the requirements of Limit 6 in the ESA 4(d) rule, including the determination that the RMPs would not appreciably reduce the likelihood of survival and recovery of the listed ESUs (Appendices A and B). Consequently, ESA take prohibitions will not apply to these programs conducted in accordance with the terms of the RMPs (Appendices A and B). Therefore, any Federal Action aiding in the implementation of the RMPs will not be subject to take prohibitions.

Incidental Take Statement

Incidental take is defined as take that is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity. Under the terms of section ESA 7(b)(4) and section 7(o)(2), taking that is incidental to and not intended as part of the agency action is not prohibited taking under the ESA, provided that such taking is in compliance with the terms and condition of this Incidental Take Statement. The actual level of take is summarized for Puget Sound chinook in Tables 4 and 6 and for Hood Canal summer chum in Tables 2 and 4, of Attachment 1 in Appendices A and B. Descriptions of the expected take are included in sections 4(i)(B) and (C) in Attachment 1 of Appendices A and B.

The reasonable and prudent measures, and corresponding terms and conditions for incidental take statement are the general and specific conditions and requirements for conducting harvest activities found within the RMPs themselves and in the Implementation Terms section of the Determination Memoranda in Appendices A and B. For Puget Sound chinook, the terms and conditions, based on the RMP implementation terms (Appendix A) are:

- (1) The TRT is in the process of determining the population structure of Puget Sound chinook and making recommendations about the roles of individual populations in the recovery of the Puget Sound chinook salmon ESU. NMFS will evaluate the RMP relative to this population delineation. In addition, NMFS will re-evaluate the RMP's management objectives and approach of the RMP upon the TRT's completion of these tasks. Should NMFS' assessment indicate that a population essential to the viability of the ESU is not adequately protected by the RMP, the Co-managers shall amend the plan as necessary to afford that protection.
- (2) Pending completion of the TRT tasks in (1) above, the Skagit summer/fall chinook management unit shall be managed through April of 2003 as described in Table 6 and the Skagit management unit profile in Appendix A of the [Puget Sound chinook] RMP. This includes management for a 52% exploitation rate ceiling as measured by the Fisheries Regulation and Assessment Model (FRAM), and further management actions consistent with Appendix C of the RMP, should either the Skagit summer/fall management unit or any of its stock components fall below its low abundance threshold. The management objectives and approach shall be re-evaluated by NMFS and the Co-managers and revised as appropriate upon the TRT's completion of these tasks.
- (3) Over the next two years, the Puget Sound Treaty Tribes and WDFW shall refine Rebuilding Exploitation Rates (RERs) for Nooksack early, Skagit spring, Stillaguamish, Snohomish, and Green River chinook management units and their associated populations, consistent with the TRT recommendations. To aid in this effort, NMFS will provide technical assistance to the Co-managers to complete this task.
- (4) Over the next two years, WDFW and the Puget Sound Treaty Tribes shall begin development of RERs for additional Category 1 and 2 populations for which data are available, or to identify what additional data are needed. To aid in this effort, NMFS will provide technical assistance to the Co-managers to complete this task.
- (5) WDFW and the affected Puget Sound Treaty Tribes shall work together with NMFS to better define the fishery actions to be taken when the escapement of the naturally spawning component of the Skokomish chinook management unit falls below 1,200.
- (6) Exploitation rates and spawning escapement objectives in the RMP have been set to facilitate rebuilding toward recovery levels. The RMP also states that the Co-managers "...may agree to take further harvest management measures if analysis demonstrates that additional management action will contribute significantly to stock recovery in concert

with other specific habitat and enhancement actions.” In its evaluation of the RMP, NMFS assumed, that in most years, fisheries would meet the exploitation rates and escapement thresholds described in Table 6 [of the Puget Sound chinook RMP]. However, in some years, low abundances for some stocks may trigger additional management actions, as described in Appendix C of the [Puget Sound chinook] RMP. NMFS assumed that the Co-manager’s commitment to application of Appendix C would result in exploitation rates similar to those in Table C-1, or in escapements above the low abundance thresholds, and, on this basis, determined the RMP to be sufficiently protective of listed populations. During the next two years, if exploitation rates on management units are forecast to result in escapements that fall below their low abundance threshold, or if exploitation rates are expected to exceed the ranges estimated in Table C-1 of Appendix C of the RMP, the Co-managers shall meet and confer with NMFS regarding what additional harvest actions, if any, may be warranted.

- (7) RMP fisheries are managed to achieve the management objectives described in Table 6 and Table C-1 of the RMP. The Green River, Lake Washington, Skokomish, Mid-Hood Canal and Nisqually management units are managed for escapement goal objectives, as well as exploitation rate objectives. In some cases, abundances in the near future are expected to be sufficient to meet or exceed their low abundance thresholds, but would not achieve their escapement goal objectives, e.g., Lake Washington. For these management units, the management unit profiles in Appendix A [of the Puget Sound chinook RMP] include an expected range of exploitation rates. During the next two years, if estimated impacts are predicted to exceed the expected ranges described in the management unit profiles of the RMP, the co-managers shall meet and confer with NMFS regarding what additional harvest actions, if any, may be warranted.
- (8) The annual Co-managers Fishery Management Plan shall provide a comprehensive summary of treaty and non-treaty salmon fisheries in Puget Sound and the Washington coast. The fishing arrangements contained within this document are based on pre-season expectations and, in some instances, may be modified on the basis of information obtained in-season and by agreement of the state and tribes. The Co-managers shall notify NMFS when in-season actions are expected to deviate significantly from the pre-season plan. The notification shall include a description of the change, an assessment of the anticipated fishing mortality resulting from the change, and an explanation of how impacts of the action(s) maintain consistency with the RMP. For those areas managed under inseason updates, the Co-managers shall notify NMFS of the results of each update, the actions taken, and an explanation of how the impacts of the actions maintain consistency with the RMP.
- (9) The Co-managers shall continue catch, coded-wire tag, effort and biological sampling in Washington fisheries to meet or exceed the target levels described in the RMP.
- (10) In many areas, the current methods of escapement estimation were not designed to provide absolute estimates of total spawning population size, but rather to indicate trends in, or

indices of spawning abundance. With changes in the use of escapement estimates, the Co-managers shall reassess and revise the approach to escapement estimation to provide information necessary and consistent with the objectives, implementation and evaluation of the RMP. The Co-managers, in conjunction with ongoing Pacific Salmon Commission efforts, shall review escapement estimation and survey methodologies for Puget Sound chinook, and shall develop recommendations for revisions to the existing methods to provide estimates of i) total spawning population size and precision of the estimates; ii) the contribution of hatchery origin fish to natural escapement; iii) the contribution of natural origin fish to hatchery rack returns; and, iv) the age structure of natural escapement and hatchery returns, for each Puget Sound chinook population. The Co-managers shall provide a progress report on the reassessment and revision of escapement estimation and survey methods, including preliminary recommendations, by January 15, 2003.

- (11) The Co-managers, in cooperation with NMFS, shall revise modeling tools used in domestic fisheries planning, e.g., FRAM, as appropriate to calculate and report exploitation rates and escapements for all management units and populations, consistent with the RMP objectives in Table 6 and Appendix A [of the RMP], and for any additional objectives developed over the next two years.
- (12) Validation of the FRAM has been completed for 1983-1996. The FRAM validation, in combination with work of the PSC Chinook Technical Committee, provides valuable information for evaluating management performance. For example, this information was used to estimate management error included in RER derivations for Puget Sound chinook. The Co-managers shall complete FRAM validations for years 1997-2000, and more recent years if needed information is available. The Co-managers shall complete the validations prior to April 30, 2003.
- (13) A significant component of the annual post-season report described in Appendix F of the RMP is the assessment of exploitation rates. The use of non-retention in both commercial and recreational fisheries is becoming more prevalent in fisheries management, as a way to decrease impacts on stocks of concern and/or increase fishing opportunity. The exploitation rate assessment shall include estimates of mortality in the non-retention fisheries and a description of the methods used in the estimation.
- (14) The monitoring and evaluation measures identified in the RMP shall assess the catch of listed fish, fishery mortality, the abundance of hatchery and listed fish originating from Puget Sound, and angler compliance. The Co-managers, in cooperation with NMFS, shall use this information annually to assess whether impacts to listed fish are as expected. As described in section V (Application) and Appendix F of the RMP, each year, the Co-managers shall provide a report that includes at least a summary of the previous year's management expectations, run size and spawning escapement by management unit and population, where appropriate, and estimated fishery impacts for each management unit, and results of in-season management activities. Postseason evaluation of management shall be based on the most direct estimates of mortality available, e.g., coded wire tags.

This report shall be provided to NMFS' Fisheries Management Branch in Seattle, Washington by mid-February of each year.

- (15) Depending on the accuracy required from biological sampling, more sampling effort may be required than has previously been expended on gathering basic biological data to determine age and sex composition. State and tribal technical staffs are currently focusing attention on the design and implementation of these studies. The Co-managers shall include a progress report and recommendations on sampling design and implementation in the post-season report for the 2002-2003 fishing season. To aid in this effort, NMFS may offer technical assistance as requested.
- (16) NMFS received several comments from the public expressing concern about the limited evaluation of the effect of fishing activities on spatial structure and biological characteristics of chinook populations, e.g., size, sex, age. In the RMP, the Co-managers identified the need to conduct analyses of harvest regulations for existence of size or sex selectivity and the extent of the potential impact, as one of several tasks "... necessary to improving the framework over the next two to five years." (WDFW/PSTT 2001). The Co-managers shall provide a report describing the data required, the information that is lacking, and the design and implementation of such an analysis. The report shall be included in the post-season report for the 2002-2003 fishing season. To aid in this effort, NMFS may offer technical assistance as requested.

For Hood Canal summer-run chum, the terms and conditions based on the implementation terms (Appendix B) are:

- (1) In the context of the SCSCI, "compliance" is intended to mean adherence, by each of the Co-managers to the guidelines, mandates and performance standards of the RMP, including adoption of any necessary rules to implement their responsibilities under the plan. All sampling, monitoring, assessment, evaluation, enforcement and reporting tasks or assignments related to harvest management in the RMP shall be conducted by the Co-managers as required in the RMP.
- (2) The RMP clearly identifies that Co-managers will coordinate and communicate with NMFS during pre-season activities associated with this RMP. Co-managers will also communicate with NMFS during in-season activities related to management, fisheries and escapement monitoring, regulatory actions and enforcement.
- (3) Co-managers shall provide NMFS an assessment report on the anticipated impacts associated with any new harvest regime on the Hood Canal Summer-Run Chum Salmon ESU. The Co-managers and NMFS will meet and discuss the results of the anticipated impacts of any new harvest regime prior to implementation.
- (4) The SCSCI states that "Recovery goals for each management unit will be developed in 2000, and the parties will subsequently determine how to incorporate the recovery goals into the management structure" (see section 3.5.11 of the RMP). Although this goal was not realized in

2000, the Co-managers are actively working on this task. As an implementation term, Co-managers shall develop recovery goals with NMFS for the Hood Canal Summer-Run Chum Salmon ESU by the first five-year plan review (to cover the period 1999 to 2003).

(5) The collection of appropriate age data for deriving survival rates is a stated high priority of the RMP and is imperative to measure progress toward recovery. As an implementation term, Co-managers shall initiate programs to determine age data sufficient for deriving survival rates, by the first five-year plan review.

(6) Releasing summer chum salmon in several fisheries targeting other species is required by the RMP. However, little is known concerning possible delayed mortality associated with the release of Hood Canal and Strait of Juan de Fuca summer chum salmon. Co-managers will seek funding to support research into non-retention mortality of listed Hood Canal and Strait of Juan de Fuca summer chum salmon. Research activities shall be coordinated with NMFS.

(7) There are currently no systematic escapement surveys for summer chum salmon in the Dungeness River. However, summer chum salmon presence is routinely noted during escapement surveys for other species. The status of the summer chum salmon population in the Dungeness River is therefore unknown at this time. As an implementation term, Co-managers shall initiate escapement surveys sufficient to determine and to monitor the status of Dungeness River summer chum salmon population by the first five-year plan review.

(8) As required in section 3.6.2 of the RMP, the Co-managers will compile all of the annual assessments required in section 3 of the RMP into an Annual Plan Progress Report. The Annual Plan Progress Report shall be provided to NMFS by May 31 of the following year.

(9) As required by the RMP, the Co-managers with NMFS will conduct the first five-year plan review in 2004 to cover the period from 1999 to 2003, following the steps outlined in section 3.6.3 of the plan in compiling the report. Co-managers shall coordinate and communicate with NMFS during the development of the report. The first five-year plan review report shall be completed and made available to NMFS by February 2005.

Conservation Measures

Section 7(a)(1) of the ESA directs Federal agencies to utilize their authorities to further the purposes of the ESA by carrying out conservation programs for the benefit of threatened and endangered species. Conservation recommendations are discretionary agency activities to minimize or avoid adverse effects of a proposed action on listed species or critical habitat, to help implement recovery plans, or to develop information. NMFS believes the following conservation recommendations, in addition to those included in the March 8, 1996, biological opinion, are consistent with these obligations, and therefore should be implemented by the NMFS.

1. The BIA and USFWS, in collaboration with the affected states and tribes, should evaluate the

ability of each listed ESU to survive and recover, given the totality of impacts affecting each ESU during all phases of the salmonid's life cycle, including freshwater, estuarine and ocean life stages. For this effort, BIA and USFWS should collaborate with the affected co-managers to evaluate available life cycle models or initiate the development of life cycle models where needed.

2. The BIA and USFWS, in collaboration with the affected states and tribes, should evaluate where possible improvement in gear technologies and fishing techniques that reduces mortality of listed species, and evaluate the effects of those gears on salmon habitat.

3. The BIA and USFWS, in collaboration with the affected states and tribes, should gather better information on ocean rearing and migration patterns to improve its understanding of the utilization and importance of these areas to listed ESUs.

Re-initiation of Consultation

This concludes formal consultation on the BIA and USFWS actions as they relate to the Puget Sound chinook and Hood Canal summer-run chum ESUs. As provided in 50 CFR §402.16, re-initiation of formal consultation is required where discretionary federal agency involvement or control over the action has been retained (or is authorized by law) and if: (1) the amount or extent of take is exceeded; (2) new information reveals effects of the action that may affect listed species or critical habitat in a manner or to an extent not previously considered; (3) the identified action is subsequently modified in a manner that causes an effect to listed species or critical habitat that was not considered in the biological opinion; (4) a new species is listed or critical habitat designated that may be affected by the identified action. In instances where the amount or extent of take is exceeded, the BIA and USFWS must immediately re-initiate formal section 7 consultation on the proposed fisheries.

In addition, 4(d) take limit has been applied to activities conducted in accordance with the Puget Sound chinook RMP for two years, through April of 2003. NMFS will base extension of the take limit beyond April, 2003 on progress made in completing the Implementation Terms described in the Determination Memorandum in Appendix A. Should NMFS not extend the take limit for the Puget Sound chinook RMP after April 30, 2003, the BIA and USFWS must re-initiate formal section 7 consultation on the proposed fisheries.

SUPPLEMENTAL A

ESSENTIAL FISH HABITAT

“Essential fish habitat” (EFH) provisions of the Magnuson-Stevens Act (MSA) require heightened consideration of fish habitat in resource management decisions. EFH is defined in section 3 of the MSA as “those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity.” The NMFS interprets EFH to include aquatic areas and their associated physical, chemical and biological properties used by fish that are necessary to support a sustainable fishery and the contribution of the managed species to a healthy ecosystem.

The MSA and its implementing regulations at 50 CFR 600.920(j) require that before a Federal agency may authorize, fund or carry out any action that may adversely effect EFH, it must consult with NMFS and, if requested, the appropriate Regional Fishery Management Council. The purpose of consultation is to develop a conservation recommendation that addresses all reasonably foreseeable adverse effects to EFH. Further, the action agency must provide a detailed response in writing to NMFS and the appropriate Council within 30 days after receiving an EFH conservation recommendation. The response must include measures proposed by the agency to avoid, minimize, mitigate, or offset the impact of the activity on EFH. If the response is inconsistent with conservation recommendations of NMFS, the agency must explain its reasons for not following the recommendations, including the scientific justification for any disagreements over the anticipated effects of the proposed action and the measures needed to avoid, minimize, or mitigate such effects.

This consultation requirement does not distinguish between actions which occur within EFH and actions outside EFH. Any reasonable attempt to encourage the conservation of EFH must take into account actions that occur outside EFH, such as upstream and up slope activities that may have an adverse effect on EFH. Therefore, EFH consultation with NMFS is required by Federal agencies undertaking permitting or funding activities that may adversely affect EFH, whatever its location.

The objective of this consultation is to determine whether the proposed actions, BIA funding of tribal fisheries programs and, as a party to the HCSMP, USFWS’ participation in the establishment of management objectives for Hood Canal and Strait of Juan de Fuca summer chum and Puget Sound chinook, is likely to adversely affect EFH. If the proposed action is likely to adversely affect EFH, conservation recommendations will be provided.

Identification of Essential Fish Habitat

The Pacific Fisheries Management Council (PFMC) is one of eight Regional Fishery Management Councils established under the MSA. The PFMC develops and carries out fisheries management plans for Pacific coast groundfish, coastal pelagic species and salmon off the coasts of Washington, Oregon and California, and recommends Pacific halibut harvest regulations to the International Pacific Halibut Commission.

Pursuant to the MSA, the PFMC has designated freshwater and marine EFH for chinook and coho salmon (PFMC 1999b), EFH for five species of coastal pelagic species (PFMC 1998a), and a “composite” EFH for 62 species of groundfish (PFMC 1998b). For purposes of this consultation, marine EFH for chinook and coho in Washington and Oregon includes all estuarine, nearshore and marine waters within the western boundary of the U.S. Exclusive Economic Zone (EEZ), 200 miles offshore. EFH for coastal pelagic species and composite EFH for groundfish in Washington and Oregon includes all waters, substrates and associated biological communities from the mean higher high water line, the upriver extent of saltwater intrusion in river mouths, and along the coast extending westward to the boundary of the EEZ. The PFMC has not identified EFH for chum salmon, but the areas used by chum for “spawning, breeding, feeding, or growth to maturity” overlap with those identified for coho and chinook salmon as encompassed by the actions considered in this consultation.

Proposed Action

The proposed action area includes the U.S. marine and freshwater areas of Puget Sound, as well as the estuaries and marine waters offshore of Washington and Oregon. The estuarine and offshore marine waters are designated EFH for various life stages of 62 species of groundfish and five coastal pelagic species. A detailed description and identification of EFH for groundfish is found in the Final Environmental Assessment/Regulatory Impact Review for Amendment 11 to The Pacific Coast Groundfish Management Plan (PFMC 1998b) and the NMFS EFH for West Coast Groundfish Appendix (Casillas *et al.* 1998). A detailed description and identification of EFH for coastal pelagic species is found in Amendment 8 to the Coastal Pelagic Species Fishery Management Plan (PFMC 1998a). The proposed action area also encompasses the Council-designated EFH for chinook salmon (*Onchorhynchus tshawytscha*) and coho salmon (*Onchorhynchus kisutch*). A description and identification of EFH for salmon is found in Appendix A to Amendment 14 to the Pacific Coast Salmon Plan (PFMC 1999b).

The objective of this EFH consultation is to determine whether the fisheries which are the subject of the BIA and USFWS actions may adversely affect EFH for any of the species for which EFH has been identified. Another objective of this EFH consultation is to recommend conservation measures to avoid, minimize, or otherwise offset potential adverse impacts to EFH resulting from the proposed activities discussed in the biological opinion above.

Effects of the Proposed Action

Harvest-related activities considered in this consultation occur from boats or along river banks using hook-and-line gear and commercial purse seines, reef nets and gill nets. These gears operate in the water column and the shallower estuarine substrates, rather than the deeper water, offshore habitats. The PFMC assessed the effects of fishing on salmon EFH and provided recommended conservation measures in Appendix A to Amendment 14 to the Pacific Coast Salmon Plan (PFMC 1999b). The PFMC also assessed the effects of fishing activities, including ghost fishing by gillnets, on EFH for groundfish and provided recommended conservation measures in the Final Environmental Assessment/Regulatory Impact Review for Amendment 11

to The Pacific Coast Groundfish Management Plan (PFMC 1998b) and the NMFS EFH for West Coast Groundfish Appendix (Casillas *et al.* 1998).

Conclusion

An assessment of the adverse effects of fishing on Pacific salmon Essential Fish Habitat (PFMC 1999) identified general categories of effects from gear and vessel operation. However, the report found that there was no direct evidence that the primary gear types (hook-and-line, purse seines and gill nets) and vessel size used in the RMP fisheries adversely affect Essential Fish Habitat. The report noted the possibility of impacts to eggs and juveniles from redd trampling during recreational fishing, and ghost-fishing from gillnets. However, the RMPs include area closures and time restrictions to limit or preclude fishing in spawning areas. State and tribal regulations require constant or frequent net attendance to minimize loss of gear, and wastage. Using the best scientific information available, the ESA consultation above, and the foregoing EFH sections, NMFS concludes that the proposed actions are not likely to adversely effect EFH.

Consultation Re-initiation

NMFS must re-initiate consultation if plans for this action are substantially revised in a way that may adversely affect EFH, or if new information becomes available that affects the basis for NMFS' EFH conservation recommendations (50 CFR §600.920(k)).

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Appendices

Appendix A: NMFS Determination Memorandum: Puget Sound Comprehensive Chinook Management Plan: Harvest Management Component, April 27, 2001.

Appendix B: NMFS Determination Memorandum: Summer Chum Salmon Conservation Initiative - An Implementation Plan to Recover Summer Chum in the Hood Canal and Strait of Juan de Fuca - Harvest Management Component, April 27, 2001.